

## CURRENT LITERATURE.

A text-book for advanced students.

It was with pleasure increasing page by page that we read Dr. Vines' latest book<sup>1</sup> which is intended as a general survey of the whole field of botany with suitable presentation of its salient features for students. Finding it necessary to revise the English edition of Prantl's *Lehrbuch der Botanik*, Dr. Vines wisely decided that it would be better, while retaining the form of the previous book, to extend it sufficiently to make it suitable for advanced students. This meant complete rewriting. The first half of the book was issued by the publishers in January, in response to numerous requests, and the second half, treating of the classification of seed plants and of physiology, is promised within the year.

The portion before us treats of the morphology, the anatomy and histology, and the classification of plants through the pteridophytes. The first of these topics was the one most in need of thorough and logical treatment, having in mind all members of the plant kingdom, and it is gratifying that it has received just such treatment.

It is really refreshing to have the special morphology of plant members discussed in such a broad and consistent way as Dr. Vines has done. We have long felt that the discussion of these matters in even the best books was obscured by the constant reference of structures to an arbitrary phanerogamic norm. It is beyond doubt that the terminology in common use has been contradictory and confusing to the last degree, largely because we have approached the simpler plants from the direction of the most complex ones. No one book can hope to work a revolution either in ideas or terminology, but this one has wrought out ideas for the most part logically and consistently. In the matter of terminology there has been as little change as possible, we think, consistent with the statement of modern views of homology. Yet to those who are unfamiliar with these homologies and the changed terms already proposed we can well understand how the book would seem almost revolutionary in this respect. Indeed this has been made the basis of severe criticism in the *Journal of Botany*.

We observe with gratification that Dr. Vines has abandoned his earlier usage of the words *dorsal* and *ventral* as applied to a leaf, which was the reverse of their ordinary application. This recalls the disap-

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<sup>1</sup>VINES, S. H.—A students' text-book of botany (first half). 8vo. pp. x + 430. Figs. 279. London: Swan Sonnenschein & Co. New York: Macmillan & Co. 1894.—7s. 6d.

proving snort with which Dr. Gray accompanied his pointed comment as he glanced over the preface of Vines' *Physiology* where an explanation of the usage to be followed therein was given: "Humph! if a man wants to call the belly the back and the back the belly I suppose there is no way to prevent it!"

In the discussion of anatomy and histology the author has followed the older lines more closely, too closely, perhaps. In the classification of the tissues, we had a right to expect the abandonment or subordination of the three tissue systems of Sachs and De Bary, which rest mainly on the course of early development and obvious but superficial anatomical relations. This is the more striking since the retention of these tissue systems is scarcely consonant with the adoption of the *stèle* as a morphological unit, a step which we think eminently good. Neither is the treatment of the sclerenchyma and sclerotic parenchyma as modern as it might be to its betterment.

Without going into details regarding the third part, the classification of plants, we may say that while we do not think well of Dr. Vines' great divisions (e. g., we cannot agree that Thallophyta constitute a group in anything like the sense in which the Bryophyta and the others do), we especially like the mode of treatment he has adopted, wherein he seems to have chosen the golden mean between overmuch detail and unintelligible generalities.

As a final word we commend the book most heartily to American teachers for the use of advanced students, for whom Goebel's *Outlines* and De Bary's *Comparative Anatomy* were too detailed, too special, and too costly. Here is a work which will serve as the text-book accompanying laboratory courses in general morphology, in histology and in physiology (when the second half appears).

We wish that the publishers would issue the work not only in a single volume, but also publish parts I and II, part III, and part IV (when ready) independently, forming thus three small volumes which might be purchased separately. This would, we are sure, vastly stimulate the sale on this side of the water and be of decided convenience to students. For the manufacture of the book we have only praise. Paper, press-work and binding are all good, and the price (of this half) is low.

#### Two laboratory manuals.

Teachers and students can hardly claim that there is no choice of laboratory manuals, as the number of these helps is rapidly increasing. Every teacher of botany, however, has his own notions, and the probabilities are that such books will continue to be written till they are as

numerous as the teachers. A late publication of this kind is that of Mr. E. R. Boyer,<sup>1</sup> instructor in biology in the Chicago schools, and his book is intended to stand for the work in biology in these very important secondary schools. The book is primarily intended for those schools that wish to offer a year of continuous work in a biological combination of zoology and botany, a thing which we do not believe in, but which is common enough. The greatest step is taken when secondary schools depart from text-book and "analysis" and seriously engage in laboratory work; and the next step in advance is taken when the plant kingdom is presented as a whole. Both these steps are taken in the book before us, which cannot, therefore, be other than helpful. Its further usefulness will depend upon the training of the teacher and the selection of proper illustrative material. That "the inductive method" demands better trained teachers than secondary schools ordinarily possess is unquestionable, but this is no fault of the method. As to the selection of material in the present book, the series of animal types is placed first and not intercalated with plant types, a thing to be commended, although we question the practicability of making the very first exercise a study of *Amoeba*, a thing that no instructor can have time to find for a large class and no beginner can find for himself. The botanical series is much shorter, as it always is in these combination guides, and is made up of *Protococcus*, *Saccharomyces*, *Spirogyra*, *Vaucheria*, *Chara*, *Marchantia*, *Pteris*, *Pinus sylvestris*, *Trillium recurvatum*, and seed studies of bean, corn and pine. We certainly question the omission of all fungi and mosses, especially when the list includes *Chara* and *Marchantia*, which are hardly typical of anything excepting themselves. With properly trained teachers, however, the book can hardly help working a revolution in the Chicago schools.

An "Elementary Practical Biology" is the title of an introduction to zoology and botany by Prof. Chas. W. Dodge of the University of Rochester.<sup>2</sup> In plan the author combines to some extent the scheme of Sedgwick and Wilson with that of Huxley and Martin. The work begins with the examination of a drop of stagnant water. He then takes up the study of the cell as seen in one-celled animals and in the tissues of higher animals. A similar study is made of vegetable cells, and this is followed by the study of a series of animals beginning with

<sup>1</sup>BOYER, EMANUEL R.—A laboratory manual in elementary biology, an inductive study in animal and plant morphology. Designed for preparatory and high schools. Small 8vo. pp. xiii + 215. D. C. Heath & Co., Boston. 1894.

<sup>2</sup>DODGE, CHAS. W.—Introduction to elementary practical biology, a laboratory guide for high schools and colleges. 8vo. pp. xxiii + 422. New York: Harper & Bros. 1894.

the sponge and ending with the frog. A similar series of plants is studied from vaucheria to the flowering plant. In the list of plant types it is difficult to discover the principle of selection. Why the blue-green algæ, the red algæ and the mosses should be omitted when Chara and Protococcus are given a place is not apparent. Yeast, penicillium and the mushroom can hardly be said to represent the fungi, nor do their life histories compare in biological interest with those of the rusts, peronosporas and lichens. The types chosen are all familiar figures in the positions they occupy but the list can hardly be said to be up to date from the standpoint of the botanist. The book contains an abundance of material to meet the wants of any school. The directions for dissection are given in the form of questions which are suggestive and stimulating and lead to the latest and best methods of making and exhibiting the more difficult anatomical preparations.

As a manual of dissection the book is a success, but as an introduction to biology it is certainly open to criticism. A number of physiological questions and experiments are introduced after the dissection of each type but the organism is always approached and chiefly studied from the standpoint of the anatomist. For the beginner certainly the working out of anatomical details is chiefly of interest and importance as it bears on the solution of problems of function. A dissection should be so planned as to lead the student to group the facts discovered as bearing on this or that problem in physiology. Details of structure which can not be readily so grouped are of secondary importance in the first year's work in biology.

The chapter devoted to the flowering plants departs from the plan of the book without being an improvement. It is a composite of studies in seeds, stems, buds and flowers of all sorts, with experiments in germination, transpiration, etc. Such studies are of course very useful and interesting but they should certainly be preceded by a study of the life history of some one flowering plant. It is as if the author had substituted for his very comprehensive and thorough dissection of the frog studies on the heads, legs, muscles, etc., of a dozen vertebrates taken more or less at random.

An appendix contains a well selected list of reference books arranged according to the list of organisms studied and descriptions of the more common reagents and their uses.

The typography and general make up of the book are excellent.

#### Agricultural Botany.

The subject of agricultural botany is a difficult one to treat. There is no well defined range to it. Usually it is made to include the ele-

mentary part of all departments of botany, with portions here and there expanded and illustrated to meet the special problems in agriculture. Occasionally a work is made to cover only those features of the science which specially affect agricultural practice. Really good examples of the latter form have not yet appeared in English, although a demand may be expected to arise eventually from our numerous agricultural colleges, if not to some degree already existent.

We believe that the subject matter of a work, which can justly bear the title of "agricultural botany," should be almost entirely, or even wholly, devoted to facts and problems of special interest to the agriculturist. Yet we are aware that many schools, even some agricultural colleges of high rank, do not provide a course in botany sufficiently full for the student to obtain, as he should do, a good foundation in the morphology, anatomy, classification and physiology of plants before entering upon the more special and more detailed study of the plant life as exhibited under the hands of the cultivator. There is a demand for a work of moderate compass at once elementary and expanded upon topics having a practical trend, that is, for a book both general and special, a vade mecum, a short cut to specialization.

The recently issued volume by Mr. M. C. Potter<sup>1</sup> covers this requirement most admirably, since it is well printed, well bound, abundantly illustrated, of handy size, covers a wide range of information, is carefully written, and contains useful matter. The thirteen chapters deal respectively with the introduction, cell, root, leaf, stem, flower, fruit and seed, food, reproduction, diseases, grasses, Leguminosæ, and classification.

The attempt to write for the comprehension of the wholly uninformed in botanical matters, while giving the latest results of research and the most recent views upon unsettled problems, often interferes with a smooth and dignified presentation.

There is little in the work that is novel either in subject matter or method of expression; it is not materially better or worse than many other treatises upon the elements of the science, except an advantage from being a recent publication. It gives another text from which to choose, particularly for the use of classes. It is certainly too much to expect that any farmer, unless he be a recent college graduate, can make much use of such a book.

After granting that the author has made a fairly wise selection of matter for his work, there is little to criticise. The use of the singular form of the word *stoma* in place of the plural on pages 45-52 may be

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<sup>1</sup>POTTER, M. C.—An elementary text-book of agricultural botany. 12 mo. pp. 250. figs. 99. London: Methuen & Co., 1893.—3s. 6d.

assumed to be an oversight. The chapter on diseases is very inadequate, and betrays a lack of knowledge of the great advances recently made in this line of study, especially in America. And one is justly suspicious of superficiality in a writer who uses the misnomer "fungoid." The first chapter contains the common attempt to show antithesis between animals and plants. The author in saying that "the plant, if supplied with the various elements required for its structure in the form of mineral matter, can perform all its various functions," etc., while "the animal, on the other hand, requires that all its food should be presented to it in the organic form," forgets or ignores for the time being that more than one fourth of all known species of plants (fungi) are as dependent upon organic food as are animals. Indeed, the fact is recognized a few pages further on, where the author says in another connection that "the fungus, in the manner of obtaining its food, resembles an animal in so far as it can only live on organic matter." How long must it be before writers will be able to forget the old fallacy of opposite characteristics in animals and plants, and come to recognize the unity of the organic world, and emphasize the correspondences rather than the antagonisms?

#### Botanical Classics.

Wilhelm Engelmann of Leipzig, to whom the botanical world is already greatly indebted for bringing out numerous standard treatises, has undertaken the publication of a uniform series of the most important of the older standard works of science under the general title of *Ostwald's Klassiker der exakten Wissenschaften*, to include works upon mathematics, astronomy, physics, chemistry and biology.

The last issue of the series is Sprengel's "Mystery of nature disclosed in the structure and in the fructification of flowers."<sup>1</sup> It is issued in four small handy volumes, well printed, bound in leatherette, and admirably adapted for perusal or ready reference.

The fourth volume is given up to the plates, which are remarkably well reproduced, although somewhat smaller than the originals. The works are issued at such a low price, and in such an attractive form, that they should greatly stimulate acquaintance of the present generation with the early masters of the science.

The recent centennial anniversary of Sprengel's discoveries makes the general value of his writings well known to all; and this publication gives an opportunity to become familiar with his own words.

<sup>1</sup>SPRENGEL, CHRISTIAN KONRAD.—Das entdeckte Geheimniss der Natur im Bau und in der Befruchtung der Blumen (1793). 4 vols. 12 mo. pp. 184+172+180+7. 25 pl. (Ostwald's Klass. d. ex. Wiss., Nos. 48, 49, 50, 51.) Wilhelm Engelmann, Leipzig, 1894. M. 2 per volume.